

SEQUENCE LISTING

<110> Ajinomoto Co., Inc.

<120> Method for Producing L-Amino Acid

<130>

<160> 24

<210> 1

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yahN gene

<400> 1

ggcgagctcc cagtaaccgg aaataag

27

<210> 2

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yahN gene

<400> 2

cgctctagaa aggaccacgc attacgg

27

<210> 3

<211> 27

<212> DNA

00459573 121399

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yeaS gene

<400> 3

ggcgagctca gattggttag catattc

27

<210> 4

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yeaS gene

<400> 4

cggctctagaa tcagcgaaga atcaggg

27

<210> 5

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yfiK gene

<400> 5

ggcgagctca tggtccgtgt cgggtac

27

<210> 6

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yfiK gene

09459573 121399

<400> 6

ggctctagat agcaagttac taagcgg

27

<210> 7

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yggA gene

<400> 7

ctctgaattc tctcttatta gtttttctga ttgcc

35

<210> 8

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yggA gene

<400> 8

cgtgacctgc agcgttctca cagcgcggta gcctttaa

38

<210> 9

<211> 672

<212> DNA

<213> Escherichia coli

<220>

<221> CDS

<222> (1)..(672)

<400> 9

atg	atg	cag	tta	ggt	cac	tta	ttt	atg	gat	gaa	atc	act	atg	gat	cct	48
Met	Met	Gln	Leu	Val	His	Leu	Phe	Met	Asp	Glu	Ile	Thr	Met	Asp	Pro	
1				5				10					15			
ttg	cat	gcc	ggt	tac	ctg	acc	gta	gga	ctg	ttc	gtg	att	act	ttt	ttt	96
Leu	His	Ala	Val	Tyr	Leu	Thr	Val	Gly	Leu	Phe	Val	Ile	Thr	Phe	Phe	

0945953 121399

20 25 30
 aat ccg gga gcc aat ctc ttt gtg gta gta caa acc agc ctg gct tcc 144
 Asn Pro Gly Ala Asn Leu Phe Val Val Val Gln Thr Ser Leu Ala Ser
 35 40 45
 ggt cga cgc gca ggg gtg ctg acc ggg ctg ggc gtg gcg ctg ggc gat 192
 Gly Arg Arg Ala Gly Val Leu Thr Gly Leu Gly Val Ala Leu Gly Asp
 50 55 60
 gca ttt tat tcc ggg ttg ggt ttg ttt ggt ctt gca acg cta att acg 240
 Ala Phe Tyr Ser Gly Leu Gly Leu Phe Gly Leu Ala Thr Leu Ile Thr
 65 70 75 80
 cag tgt gag gag att ttt tcg ctt atc aga atc gtc ggc ggc gct tat 288
 Gln Cys Glu Glu Ile Phe Ser Leu Ile Arg Ile Val Gly Gly Ala Tyr
 85 90 95
 ctc tta tgg ttt gcg tgg tgc agc atg cgc cgc cag tca aca ccg caa 336
 Leu Leu Trp Phe Ala Trp Cys Ser Met Arg Arg Gln Ser Thr Pro Gln
 100 105 110
 atg agc aca cta caa caa ccg att agc gcc ccc tgg tat gtc ttt ttt 384
 Met Ser Thr Leu Gln Gln Pro Ile Ser Ala Pro Trp Tyr Val Phe Phe
 115 120 125
 cgc cgc gga tta att acc gat ctc tct aac ccg caa acc gtt tta ttt 432
 Arg Arg Gly Leu Ile Thr Asp Leu Ser Asn Pro Gln Thr Val Leu Phe
 130 135 140
 ttt atc agt att ttc tca gta aca tta aat gcc gaa aca cca aca tgg 480
 Phe Ile Ser Ile Phe Ser Val Thr Leu Asn Ala Glu Thr Pro Thr Trp
 145 150 155 160
 gca cgt tta atg gcc tgg gcg ggg att gtg ctc gca tca att atc tgg 528
 Ala Arg Leu Met Ala Trp Ala Gly Ile Val Leu Ala Ser Ile Ile Trp
 165 170 175
 cga gtt ttt ctt agt cag gcg ttt tct ttg ccc gct gtg cgt cgt gct 576
 Arg Val Phe Leu Ser Gln Ala Phe Ser Leu Pro Ala Val Arg Arg Ala
 180 185 190
 tat ggg cgt atg caa cgc gtt gcc agt cgg gtt att ggt gca att att 624
 Tyr Gly Arg Met Gln Arg Val Ala Ser Arg Val Ile Gly Ala Ile Ile
 195 200 205
 ggt gta ttc gcg cta cgc ctg att tac gaa ggg gtg acg cag cgg tga 672
 Gly Val Phe Ala Leu Arg Leu Ile Tyr Glu Gly Val Thr Gln Arg
 210 215 220

<210> 10

<211> 223

<212> PRT

<213> Escherichia coli

09459573 121399

<400> 10

Met Met Gln Leu Val His Leu Phe Met Asp Glu Ile Thr Met Asp Pro
 1 5 10 15
 Leu His Ala Val Tyr Leu Thr Val Gly Leu Phe Val Ile Thr Phe Phe
 20 25 30
 Asn Pro Gly Ala Asn Leu Phe Val Val Val Gln Thr Ser Leu Ala Ser
 35 40 45
 Gly Arg Arg Ala Gly Val Leu Thr Gly Leu Gly Val Ala Leu Gly Asp
 50 55 60
 Ala Phe Tyr Ser Gly Leu Gly Leu Phe Gly Leu Ala Thr Leu Ile Thr
 65 70 75 80
 Gln Cys Glu Glu Ile Phe Ser Leu Ile Arg Ile Val Gly Gly Ala Tyr
 85 90 95
 Leu Leu Trp Phe Ala Trp Cys Ser Met Arg Arg Gln Ser Thr Pro Gln
 100 105 110
 Met Ser Thr Leu Gln Gln Pro Ile Ser Ala Pro Trp Tyr Val Phe Phe
 115 120 125
 Arg Arg Gly Leu Ile Thr Asp Leu Ser Asn Pro Gln Thr Val Leu Phe
 130 135 140
 Phe Ile Ser Ile Phe Ser Val Thr Leu Asn Ala Glu Thr Pro Thr Trp
 145 150 155 160
 Ala Arg Leu Met Ala Trp Ala Gly Ile Val Leu Ala Ser Ile Ile Trp
 165 170 175
 Arg Val Phe Leu Ser Gln Ala Phe Ser Leu Pro Ala Val Arg Arg Ala
 180 185 190
 Tyr Gly Arg Met Gln Arg Val Ala Ser Arg Val Ile Gly Ala Ile Ile
 195 200 205
 Gly Val Phe Ala Leu Arg Leu Ile Tyr Glu Gly Val Thr Gln Arg
 210 215 220

<210> 11

<211> 639

<212> DNA

<213> Escherichia coli

<220>

<221> CDS

<222> (1)..(639)

<400> 11

gtg ttc gct gaa tac ggg gtt ctg aat tac tgg acc tat ctg gtt ggg 48

09459573 121399

<210> 12
 <211> 212
 <212> PRT
 <213> Escherichia coli

<400> 12

Met Phe Ala Glu Tyr Gly Val Leu Asn Tyr Trp Thr Tyr Leu Val Gly
 1 5 10 15
 Ala Ile Phe Ile Val Leu Val Pro Gly Pro Asn Thr Leu Phe Val Leu
 20 25 30
 Lys Asn Ser Val Ser Ser Gly Met Lys Gly Gly Tyr Leu Ala Ala Cys
 35 40 45
 Gly Val Phe Ile Gly Asp Ala Val Leu Met Phe Leu Ala Trp Ala Gly
 50 55 60
 Val Ala Thr Leu Ile Lys Thr Thr Pro Ile Leu Phe Asn Ile Val Arg
 65 70 75 80
 Tyr Leu Gly Ala Phe Tyr Leu Leu Tyr Leu Gly Ser Lys Ile Leu Tyr
 85 90 95
 Ala Thr Leu Lys Gly Lys Asn Ser Glu Ala Lys Ser Asp Glu Pro Gln
 100 105 110
 Tyr Gly Ala Ile Phe Lys Arg Ala Leu Ile Leu Ser Leu Thr Asn Pro
 115 120 125
 Lys Ala Ile Leu Phe Tyr Val Ser Phe Phe Val Gln Phe Ile Asp Val
 130 135 140
 Asn Ala Pro His Thr Gly Ile Ser Phe Phe Ile Leu Ala Ala Thr Leu
 145 150 155 160
 Glu Leu Val Ser Phe Cys Tyr Leu Ser Phe Leu Ile Ile Ser Gly Ala
 165 170 175
 Phe Val Thr Gln Tyr Ile Arg Thr Lys Lys Lys Leu Ala Lys Val Gly
 180 185 190
 Asn Ser Leu Ile Gly Leu Met Phe Val Gly Phe Ala Ala Arg Leu Ala
 195 200 205
 Thr Leu Gln Ser
 210

<210> 13
 <211> 588
 <212> DNA
 <213> Escherichia coli

<220>
 <221> CDS

09459573-12139

<222> (1)..(588)

<400> 13

gtg	aca	ccg	acc	ctt	tta	agt	gct	ttt	tgg	act	tac	acc	ctg	att	acc	48
Met	Thr	Pro	Thr	Leu	Leu	Ser	Ala	Phe	Trp	Thr	Tyr	Thr	Leu	Ile	Thr	
1				5					10					15		
gct	atg	acg	cca	gga	ccg	aac	aat	att	ctc	gcc	ctt	agc	tct	gct	acg	96
Ala	Met	Thr	Pro	Gly	Pro	Asn	Asn	Ile	Leu	Ala	Leu	Ser	Ser	Ala	Thr	
			20					25				30				
tcg	cat	gga	ttt	cgt	caa	agt	acc	cgc	gtg	ctg	gca	ggg	atg	agt	ctg	144
Ser	His	Gly	Phe	Arg	Gln	Ser	Thr	Arg	Val	Leu	Ala	Gly	Met	Ser	Leu	
		35				40					45					
gga	ttt	ttg	att	gtg	atg	tta	ctg	tgt	gcg	ggc	att	tca	ttt	tca	ctg	192
Gly	Phe	Leu	Ile	Val	Met	Leu	Leu	Cys	Ala	Gly	Ile	Ser	Phe	Ser	Leu	
	50					55				60						
gca	gtg	att	gac	ccg	gca	gcg	gta	cac	ctt	ttg	agt	tgg	gcg	ggg	gcg	240
Ala	Val	Ile	Asp	Pro	Ala	Ala	Val	His	Leu	Leu	Ser	Trp	Ala	Gly	Ala	
	65				70				75				80			
gca	tat	att	gtc	tgg	ctg	gcg	tgg	aaa	atc	gcc	acc	agc	cca	aca	aag	288
Ala	Tyr	Ile	Val	Trp	Leu	Ala	Trp	Lys	Ile	Ala	Thr	Ser	Pro	Thr	Lys	
			85					90				95				
gaa	gac	gga	ctt	cag	gca	aaa	cca	atc	agc	ttt	tgg	gcc	agc	ttt	gct	336
Glu	Asp	Gly	Leu	Gln	Ala	Lys	Pro	Ile	Ser	Phe	Trp	Ala	Ser	Phe	Ala	
		100						105				110				
ttg	cag	ttt	gtg	aac	gtc	aaa	atc	att	ttg	tac	ggt	ggt	acg	gca	ctg	384
Leu	Gln	Phe	Val	Asn	Val	Lys	Ile	Ile	Leu	Tyr	Gly	Val	Thr	Ala	Leu	
	115					120					125					
tcg	acg	ttt	ggt	ctg	ccg	caa	aca	cag	gcg	tta	agc	tgg	gta	ggt	ggc	432
Ser	Thr	Phe	Val	Leu	Pro	Gln	Thr	Gln	Ala	Leu	Ser	Trp	Val	Val	Gly	
	130					135				140						
gtc	agc	ggt	ttg	ctg	gcg	atg	att	ggg	acg	ttt	ggc	aat	gtg	tgc	tgg	480
Val	Ser	Val	Leu	Leu	Ala	Met	Ile	Gly	Thr	Phe	Gly	Asn	Val	Cys	Trp	
	145				150				155				160			
gcg	ctg	gcg	ggg	cat	ctg	ttt	cag	cga	ttg	ttt	cgc	cag	tat	ggt	cgc	528
Ala	Leu	Ala	Gly	His	Leu	Phe	Gln	Arg	Leu	Phe	Arg	Gln	Tyr	Gly	Arg	
			165					170				175				
cag	tta	aat	atc	gtg	ctt	gcc	ctg	ttg	ctg	gtc	tat	tgc	gcg	gta	cgc	576
Gln	Leu	Asn	Ile	Val	Leu	Ala	Leu	Leu	Leu	Val	Tyr	Cys	Ala	Val	Arg	
		180						185				190				
att	ttc	tat	taa													588
Ile	Phe	Tyr														
		195														

0945051 E2565460

<210> 14
 <211> 195
 <212> PRT
 <213> Escherichia coli

<400> 14
 Met Thr Pro Thr Leu Leu Ser Ala Phe Trp Thr Tyr Thr Leu Ile Thr
 1 5 10 15
 Ala Met Thr Pro Gly Pro Asn Asn Ile Leu Ala Leu Ser Ser Ala Thr
 20 25 30
 Ser His Gly Phe Arg Gln Ser Thr Arg Val Leu Ala Gly Met Ser Leu
 35 40 45
 Gly Phe Leu Ile Val Met Leu Leu Cys Ala Gly Ile Ser Phe Ser Leu
 50 55 60
 Ala Val Ile Asp Pro Ala Ala Val His Leu Leu Ser Trp Ala Gly Ala
 65 70 75 80
 Ala Tyr Ile Val Trp Leu Ala Trp Lys Ile Ala Thr Ser Pro Thr Lys
 85 90 95
 Glu Asp Gly Leu Gln Ala Lys Pro Ile Ser Phe Trp Ala Ser Phe Ala
 100 105 110
 Leu Gln Phe Val Asn Val Lys Ile Ile Leu Tyr Gly Val Thr Ala Leu
 115 120 125
 Ser Thr Phe Val Leu Pro Gln Thr Gln Ala Leu Ser Trp Val Val Gly
 130 135 140
 Val Ser Val Leu Leu Ala Met Ile Gly Thr Phe Gly Asn Val Cys Trp
 145 150 155 160
 Ala Leu Ala Gly His Leu Phe Gln Arg Leu Phe Arg Gln Tyr Gly Arg
 165 170 175
 Gln Leu Asn Ile Val Leu Ala Leu Leu Leu Val Tyr Cys Ala Val Arg
 180 185 190
 Ile Phe Tyr
 195

<210> 15
 <211> 636
 <212> DNA
 <213> Escherichia coli

<220>
 <221> CDS
 <222> (1)..(636)

0045953 121399

<400> 15

gtg ttt tct tat tac ttt caa ggt ctt gca ctt ggg gcg gct atg atc	48
Met Phe Ser Tyr Tyr Phe Gln Gly Leu Ala Leu Gly Ala Ala Met Ile	
1 5 10 15	
cta ccg ctc ggt cca caa aat gct ttt gtg atg aat cag ggc ata cgt	96
Leu Pro Leu Gly Pro Gln Asn Ala Phe Val Met Asn Gln Gly Ile Arg	
20 25 30	
cgt cag tac cac att atg att gcc tta ctt tgt gct atc agc gat ttg	144
Arg Gln Tyr His Ile Met Ile Ala Leu Leu Cys Ala Ile Ser Asp Leu	
35 40 45	
gtc ctg att tgc gcc ggg att ttt ggt ggc agc gcg tta ttg atg cag	192
Val Leu Ile Cys Ala Gly Ile Phe Gly Gly Ser Ala Leu Leu Met Gln	
50 55 60	
tcg ccg tgg ttg ctg gcg ctg gtc acc tgg ggc ggc gta gcc ttc ttg	240
Ser Pro Trp Leu Leu Ala Leu Val Thr Trp Gly Gly Val Ala Phe Leu	
65 70 75 80	
ctg tgg tat ggt ttt ggc gct ttt aaa aca gca atg agc agt aat att	288
Leu Trp Tyr Gly Phe Gly Ala Phe Lys Thr Ala Met Ser Ser Asn Ile	
85 90 95	
gag tta gcc agc gcc gaa gtc atg aag caa ggc aga tgg aaa att atc	336
Glu Leu Ala Ser Ala Glu Val Met Lys Gln Gly Arg Trp Lys Ile Ile	
100 105 110	
gcc acc atg ttg gca gtg acc tgg ctg aat ccg cat gtt tac ctg gat	384
Ala Thr Met Leu Ala Val Thr Trp Leu Asn Pro His Val Tyr Leu Asp	
115 120 125	
act ttt gtt gta ctg ggc agc ctt ggc ggg caa ctt gat gtg gaa cca	432
Thr Phe Val Val Leu Gly Ser Leu Gly Gly Gln Leu Asp Val Glu Pro	
130 135 140	
aaa cgc tgg ttt gca ctc ggg aca att agc gcc tct ttc ctg tgg ttc	480
Lys Arg Trp Phe Ala Leu Gly Thr Ile Ser Ala Ser Phe Leu Trp Phe	
145 150 155 160	
ttt ggt ctg gct ctt ctc gca gcc tgg ctg gca ccg cgt ctg cgc acg	528
Phe Gly Leu Ala Leu Leu Ala Ala Trp Leu Ala Pro Arg Leu Arg Thr	
165 170 175	
gca aaa gca cag cgc att atc aat ctg gtt gtg gga tgt gtt atg tgg	576
Ala Lys Ala Gln Arg Ile Ile Asn Leu Val Val Gly Cys Val Met Trp	
180 185 190	
ttt att gcc ttg cag ctg gcg aga gac ggt att gct cat gca caa gcc	624
Phe Ile Ala Leu Gln Leu Ala Arg Asp Gly Ile Ala His Ala Gln Ala	
195 200 205	
ttg ttc agt tag	636

004552" 12130

Leu Phe Ser
210

<210> 16

<211> 211

<212> PRT

<213> Escherichia coli

<400> 16

Met Phe Ser Tyr Tyr Phe Gln Gly Leu Ala Leu Gly Ala Ala Met Ile
1 5 10 15
Leu Pro Leu Gly Pro Gln Asn Ala Phe Val Met Asn Gln Gly Ile Arg
20 25 30
Arg Gln Tyr His Ile Met Ile Ala Leu Leu Cys Ala Ile Ser Asp Leu
35 40 45
Val Leu Ile Cys Ala Gly Ile Phe Gly Gly Ser Ala Leu Leu Met Gln
50 55 60
Ser Pro Trp Leu Leu Ala Leu Val Thr Trp Gly Gly Val Ala Phe Leu
65 70 75 80
Leu Trp Tyr Gly Phe Gly Ala Phe Lys Thr Ala Met Ser Ser Asn Ile
85 90 95
Glu Leu Ala Ser Ala Glu Val Met Lys Gln Gly Arg Trp Lys Ile Ile
100 105 110
Ala Thr Met Leu Ala Val Thr Trp Leu Asn Pro His Val Tyr Leu Asp
115 120 125
Thr Phe Val Val Leu Gly Ser Leu Gly Gly Gln Leu Asp Val Glu Pro
130 135 140
Lys Arg Trp Phe Ala Leu Gly Thr Ile Ser Ala Ser Phe Leu Trp Phe
145 150 155 160
Phe Gly Leu Ala Leu Leu Ala Ala Trp Leu Ala Pro Arg Leu Arg Thr
165 170 175
Ala Lys Ala Gln Arg Ile Ile Asn Leu Val Val Gly Cys Val Met Trp
180 185 190
Phe Ile Ala Leu Gln Leu Ala Arg Asp Gly Ile Ala His Ala Gln Ala
195 200 205
Leu Phe Ser
210

<210> 17

<211> 20

<212> DNA

<213> Artificial Sequence

0045953.12390

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yahN gene

<400> 17

gtgtggaacc gacgcccggat

20

<210> 18

<211> 23

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yahN gene

<400> 18

tgttgatatgg tacgggggttc gag

23

<210> 19

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yeaS gene

<400> 19

ctttgccaat cccgtctccc

20

<210> 20

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yeaS gene

<400> 20

09459573.121399

gccccatgca taacggaaag

20

<210> 21

<211> 26

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yfiK gene

<400> 21

gaagatcttg taggccggat aagcgc

26

<210> 22

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yfiK gene

<400> 22

tggttttacc aattggccgc

20

<210> 23

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yggA gene

<400> 23

acttctcccg cgagccagtt c

21

<210> 24

<211> 21

<212> DNA

<213> Artificial Sequence

09459573.121399

<220>

<223> Description of Artificial Sequence: primer for amplifying Escherichia coli yggA gene

<400> 24

ggcaagctta gcgcctctgt t

21

0545953.121399